

DC 384
TRANSISTOR DC-DC POWER
SUPPLY

NOTE! SEE PAGE 7 ABOUT THERMAL CUT-OUT RELAY IN THIS UNIT.

The new WRL DC 384 transistor power supply is designed for use with the Duo-Bander 84 transceiver. It may also be used with any equipment having similar power requirements. It features all aluminum chassis and heat sinks for rapid transfer of heat as well as heavy duty switching transistors.

The input voltage ratings are: 12-14VDC---13VDC nominal. IMPORTANT! This supply may only be used with an automotive system which has NEGATIVE ground. The outputs are: 800VDC @ 400 Ma. (peak-SSB ratings only); 325 VDC @ 200 Ma.; negative 100VDC @ 35 Ma. It will also provide relay switching and filament power of 12VDC @ 10A. max.

Should there be any evidence of damage on receipt, either hidden or obvious, a claim should be filed with the delivering carrier immediately, to protect your interests. Refer to claim information given in our other major equipment manuals. Our standard warranty applies to this equipment. All items are warranted, except fuses.

Installation should not prove difficult in most cases, however, there are certain precautions and necessary conditions which must be observed to obtain a good installation.

- (a) This unit is furnished with the primary power cables attached. They are marked plus and minus on the case where the wires enter. Be certain the wires are not reversed. Also, these wires may NOT be lengthened or poor voltage regulation will result. **Do not start car unless DC 384 turned off!**
- (b) The case design makes the unit substantially splash proof, though not completely water proof. It may be mounted where water will occasionally splash on it without harm. It should be mounted so that the cables face to the rear and minimize water entry through the grommets passing the cables.
- (c) It is important that the supply be mounted in a position where there is good air movement. In the engine compartment the air movement is poor near the firewall and this is the worst position. Mounting should be as far forward as possible. Many cars have sufficient space between the grill and the radiator and this is generally an ideal mounting place.
- (d) To obtain maximum cooling of the unit it is also desirable to obtain the best possible heat transfer from the supply to the car frame. When mounting

use the flattest possible position so as much of the supply case as practical will be in contact with the car frame or body. It is also well to clean this surface thoroughly before mounting the supply.

(e) The supply is to be mounted by heavy sheet metal screws or bolts passed through the four holes (two each side) in the bottom flange of the U shaped heat fins of the supply.

The cable and plug from the DC supply to the equipment is not supplied. Belden cable #8469 should be used and its length should not exceed 10 feet. The power output terminals of the supply are located under the bottom plate. The voltage out or function of each terminal is stamped on the plate near the terminal strip. They are as follows:

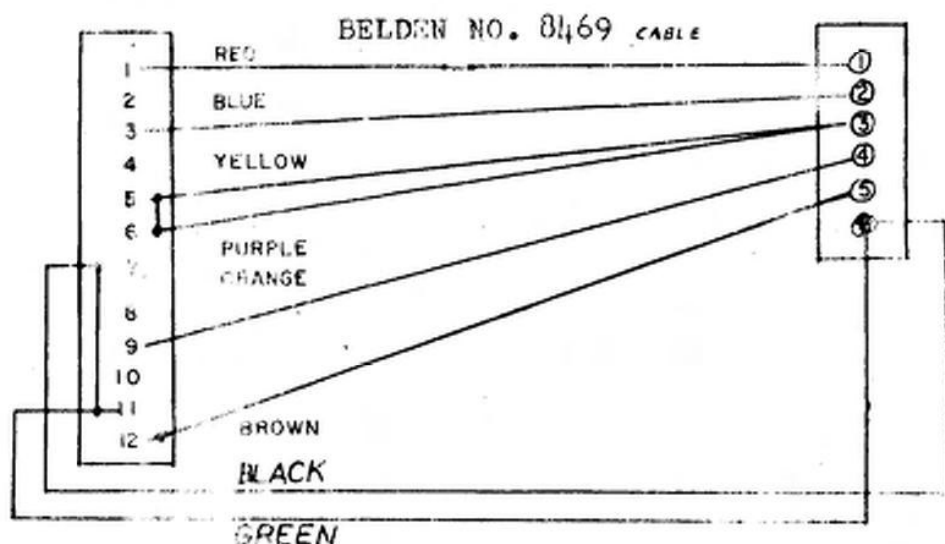
#1	plus-800VDC @ 400 Ma. (peak current)	high voltage
#2	plus-325VDC @ 200 Ma.	low voltage
#3	plus-12VDC @ 6 Amp.	filaments and transistors
#4	minus-100VDC @ 35 Ma.	bias
#5	relay control	ground to turn supply on
#6	ground	ground

FIGURE #1 - CABLE CONNECTIONS FROM THE DC 384 SUPPLY TO THE DUO-BANDER 84

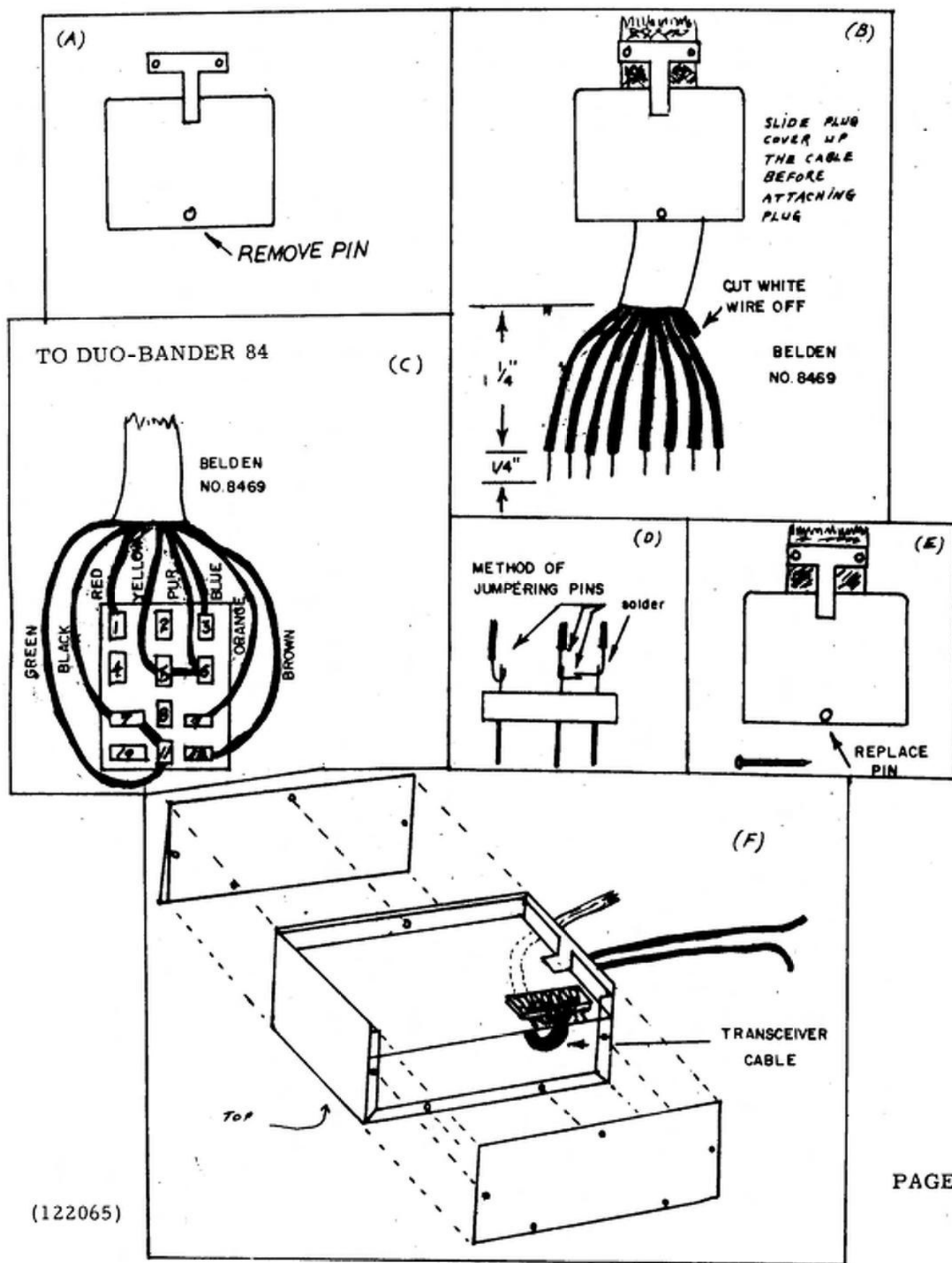
BELDEN NO. 8469

DUO-BANDER 84

MOBILE
POWER
SUPPLY



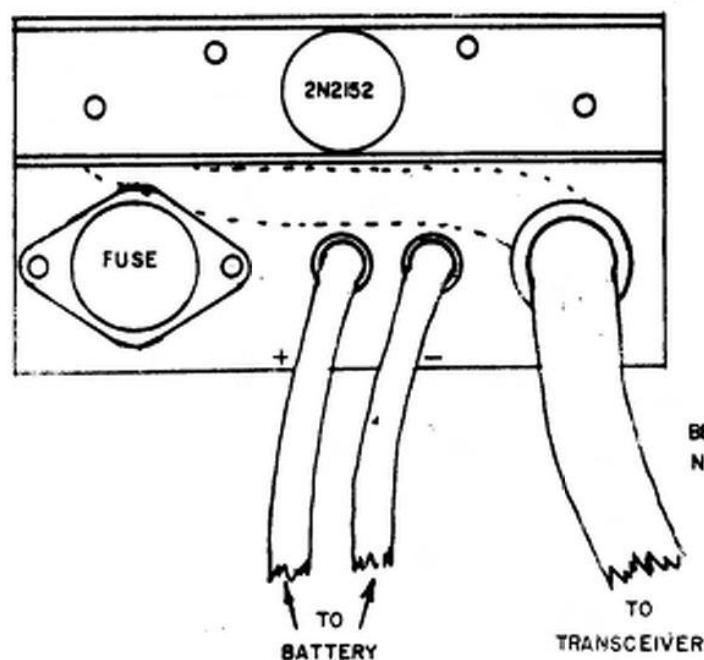
Cable wiring and connection to the DC 384 supply is shown pictorially in the following steps. Study each step carefully and no trouble should be encountered.



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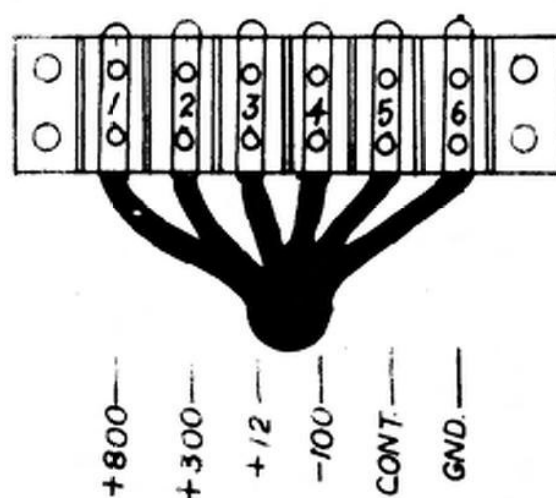
A slight application of petroleum jelly to the grommets on the supply housing will make it easier to pull the cable through.

(G)



BELDEN
NO. 8469

(H)



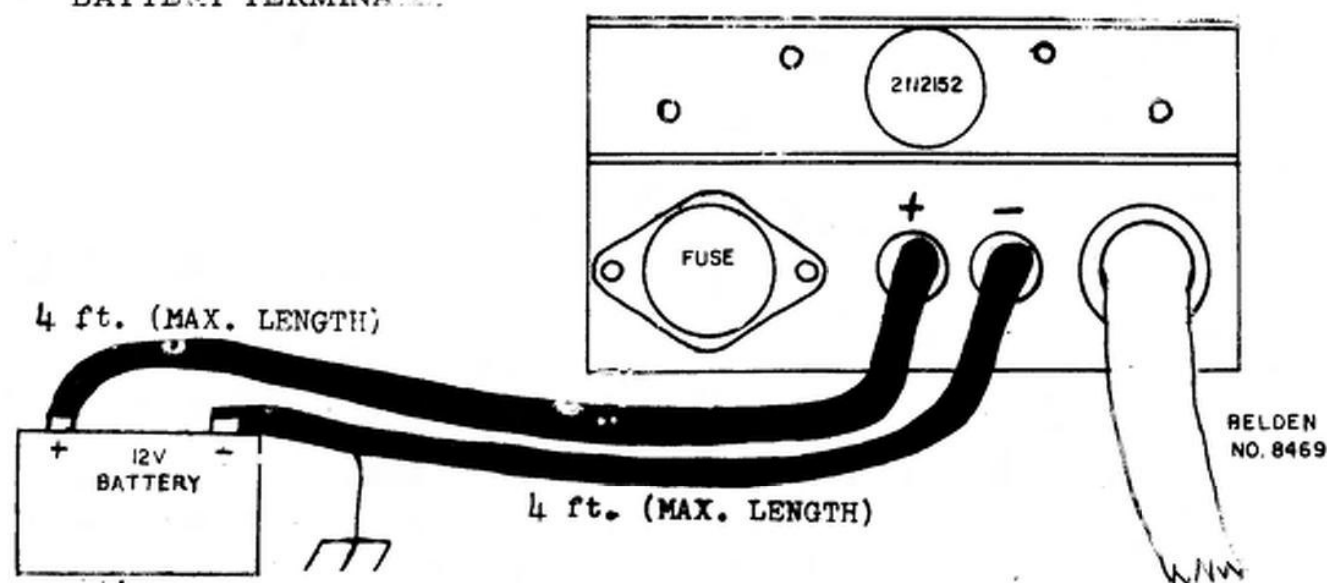
colors of 8469
cable

1. RED
2. BLUE
3. YELLOW
3. PURPLE
4. ORANGE
5. BROWN
6. GREEN
- BLACK

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NOTE! CONNECT
CABLES DIRECT TO
BATTERY TERMINALS



BE SURE POLARITY IS NOT REVERSED ON THE PRIMARY CABLES!

After connecting the power cable, replace the side and bottom panels of the supply.

WARNING! Before connecting the primary cables of the supply to the battery terminals, first check the voltage output of the generator. To do this, first turn on the car headlights for about 5 minutes without the motor running to discharge the battery a bit. Connect the voltmeter to ground and at the generator output terminal. Start the motor and check the voltage output of the generator with the motor at a fast idle. It should not exceed 14.5 volts. If it does, it will be necessary to reset the generator voltage regulator so as not to exceed 14.5 volts at the generator. If the check shows the voltage is ok, the primary cables may then be attached. Use connectors as available which will give a positive, low loss connection to the battery terminals. Normally, with the transceiver on and in receiving condition, the voltage measured at the battery terminals should not exceed 14 volts maximum with good motor speed.

The supply will now be turned on when the off-on switch of the Duo-Bander 84 is operated. (part of the audio volume control) When operating properly, there will be a slightly audible tone of about 400 cycles heard near the DC 384 supply.

The condition which will most likely cause damage to a transistor is when the user has been driving for some time, especially on the highway and stops. Heat build-up in the motor compartment is very fast and very high and in such situations it is best to turn off the equipment until the car is moving again. The majority of transistor failures are traceable to users driving on the highway then stopping and continuing to use the equipment while extreme heat builds up in the motor compartment.

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NEVER use a fuse over 40 amp.

In most cases, when the 40 amp. fuse blows it indicates a strong probability of having lost a transistor. However, sometimes a surge could blow a fuse without such damage occurring and a new fuse should be installed and tried before further investigation is made. If the supply operates ok then it indicates no damage done. If, however, it instantly blows the new fuse it is most surely an indication of a bad transistor or a short in the primary cables, providing there is no filament or pilot voltage reaching the transceiver.

The following checks may be made to isolate various problems that might be encountered, and speed servicing in the field. However, we suggest that no work be done in the field unless you anticipate completing the work in the field.

Should the fuse blow instantly, it indicates a high current short in the 12VDC line, either in the supply, the power cable to the transceiver, or in the transceiver. The first step should be to unplug the power cable from the transceiver, remove the bottom panel from the supply to have access to the terminals and, with the aid of a short jumper wire, connect terminal #5 in the supply to the car frame. This will normally start the supply (replace fuse blown in tests). If it does now start and apparently operate ok (as generally evidenced by the 400 cycle tone) (or as checked for voltage output with a meter) it would indicate the short is in the transceiver.

If the supply blows another fuse, you can isolate the cable as a source by disconnecting all cable wires at the supply terminal board and again starting the supply by jumpering terminal #5 to car frame. If the supply is ok now, the trouble is in the cable. If another fuse blows the trouble is in the supply. -- Remove the supply and very carefully look for components that might be touching the case and causing a short. If none observed, then it is reasonably certain the trouble is a bad transistor. Where a bad transistor is the conclusion of the tests made, it can be verified with a simple VOM test, using a low Ohm scale which will read 5 Ohms or less. To make the test, disconnect the two wires to the lugs of the transistor (use long nose pliers to hold the lugs near the case and prevent overheating the transistor) and measure resistance between the two lugs. It should be at least 3 Ohms. A bad one will show a direct short. If good, immediately reconnect the wires, taking care not to reverse them. Use the pliers again for a heat sink. Check the other transistor. Replace one found shorted.

If the supply operates apparently (tone heard or dial lights on transceiver still light) it tends to indicate an open circuit in the supply of power cable. If in the supply it may be a diode in the rectifier, etc.

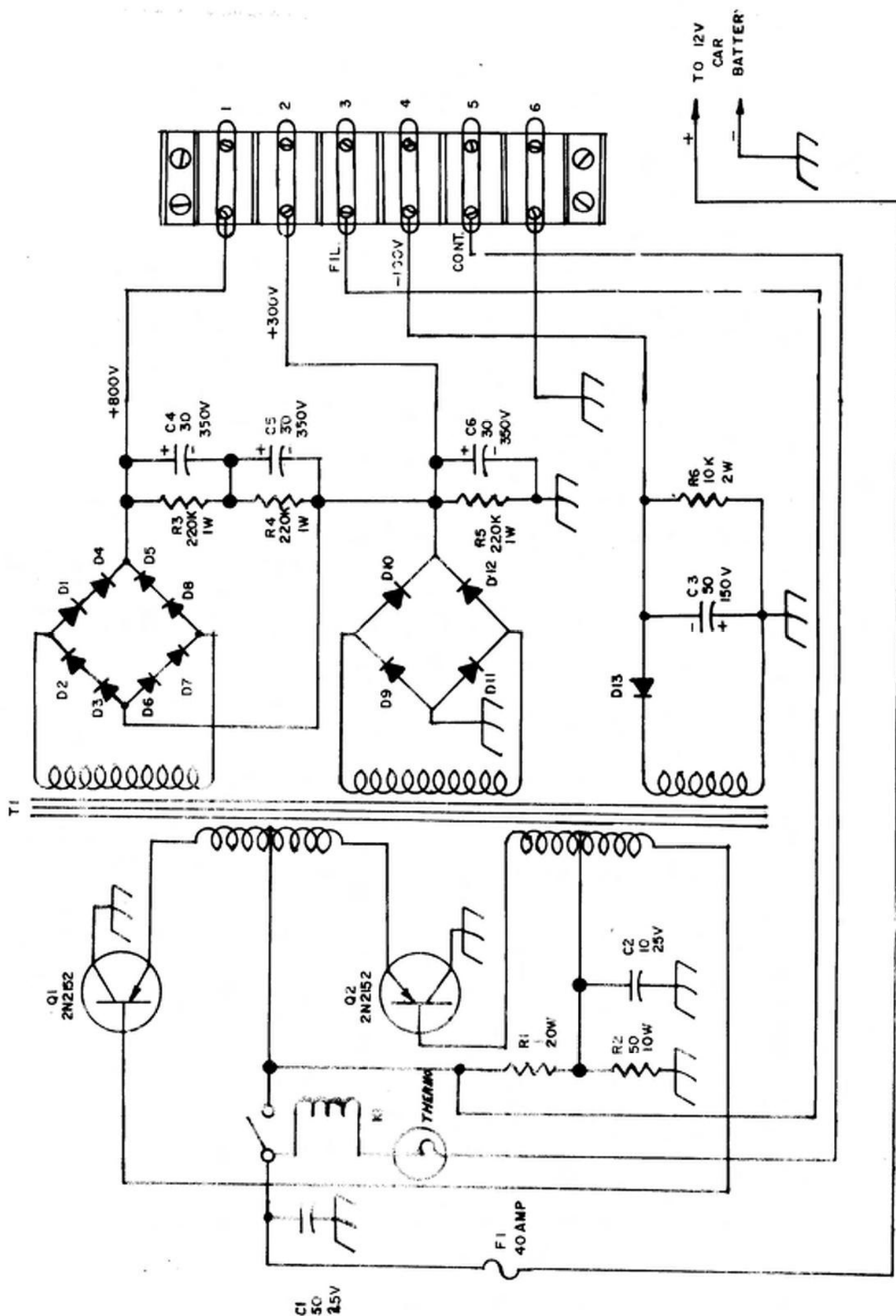
DC 384 SUPPLY PARTS LISTING
(Items normally replaceable)

Symbol	Description	Part #	Cost <u>each</u>
C1	50 MFD @ 25VDC	29-10	\$ 1.03
C2	10 MFD @ 25VDC	29-11	.89
C3	50 MFD @ 150VDC	24-26	.99
C4-5-6	30 MFD @ 350VDC	24-25	1.12
R1	1 ohm, 20 watt	11-8E	\$.75
R2	50 ohm, 10 watt	11-13D	.27
R3-4-5	220,000 ohm, 1 watt	11-69A	.18
R6	10,000 ohm, 2 watt	11-64B	.24
D1 through D13	diode, 400PIV, 750 Ma.	112-501	\$.42
Q1-2	transistor, 2N2152	111-5	7.20
F1	fuse, AGU-40 (40 amp.)	114-6	\$.18
T1	power transformer, special	70-9	33.66
K1	12VDC relay, SPST	116-9	9.06
--	terminal block, 6 contact	83-2	.96
--	fuse holder (complete only)	66-3	.81
THERMO	Special thermal relay	220-1	3.06

NOTE! -- The special thermal relay (THERMO ON THE DIAGRAM) has been included in this unit to offer the user a great deal of protection to loss of components, especially transistors. If a nominal temperature of 176 degrees is exceeded this protective device will open the primary relay and render the supply inoperative until the temperature drops to a safer level, at which time it will automatically reactivate the supply.

Loss of operation during a transmission due to this relay is certainly more desirable than loss of operation due to transistor failure. Proper mounting in a well ventilated area will prevent loss of operation due to either of the above causes, barring other factors of unusual natural heat, etc.

MOBILE POWER SUPPLY



SERVICE AND RETURNS

When writing, please give the following information: (a) Model, (b) Serial, (c) Date of purchase, (d) Our part number for any parts described. Send correspondence to: World Radio Laboratories, Inc., Technical Dept., Box 919, Council Bluffs, Iowa 51501.

INFORMATION ONLY

If only information is required, state the exact nature of the information required as briefly as possible, referring to our part numbers where describing a part, effects observed and measurements taken. Mention how the unit is installed as accurately as possible.

PARTS REQUIRED-NOT IN WARRANTY

In the event it is known exactly what parts are required, we will ship direct where your check covering parts and postage is enclosed with the order. Please remit in full for orders under \$5.00. If over \$5.00, we can ship C. O. D. with a \$5.00 deposit.

PARTS REQUIRED-IN WARRANTY

For warranty parts exchange we must have your warranty card on file. It is important that it be returned immediately when the equipment is received. There may be a delay on warranty requests if the card is not on file. Where warranty is verified, we can normally exchange parts which are defective with little delay.

RETURNING EQUIPMENT FOR SERVICE

Do NOT ship equipment without prior authorization from us by mail or phone. Shipping equipment unexpectedly usually results in delays. Where possible, we prefer to send special return labels to identify and expedite. Bus is a fast means for shipping, or AIR EXPRESS should be used for fastest handling.

When shipping equipment to us be SURE it is insured. Our warranty does NOT cover repairs due to shipping damage. If received in damaged condition repairs may be delayed while we file a claim with the carrier to protect your interests. Repairs will be at the shippers expense, though you may be able to obtain reimbursement from the carrier later.

PREPAY ALL SHIPMENTS TO US.

WARRANTY

WORLD RADIO LABORATORIES, INC. warrants each new product manufactured by it to be free from defective material or workmanship and agrees to remedy any such defect or to furnish a new part in exchange for any part of a unit of its manufacture which under normal installation, use and service discloses such defect, provided the unit is delivered by the owner to WORLD RADIO LABORATORIES, INC. with all transportation charges paid and provided that examination, in our judgement thus discloses it is defective. Labor and all parts are warranted for 90 days from the date of sale to the original owner.

This warranty does not extend to any of our products which have been subjected to misuse, neglect, accident, incorrect wiring not our own, improper use or installation. Nor does the warranty cover accessories not of our manufacture, where the serial has been removed, changed or defaced. We do not authorize the purchase of replacement parts, nor will we reimburse the owner for such purchases.

This warranty applies only to the original purchaser and is not transferable. This warranty is in lieu of all other warranties expressed or implied and no representative or person is authorized to assume for us any other liability in connection with the sale of our products.

WORLD RADIO LABORATORIES, INC. reserves the right to change circuit design, component specifications, features, or any other previously advertised specifications at any time without advance notice or incurring any obligation to purchasers of products previously manufactured or sold.

All above expressed warranties are VOID one year after the last unit of this model has been manufactured by us.